UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/583,177	05/30/2000	Bijendra N Jain	M-7915US	5355

33031 7590 01/11/2005

CAMPBELL STEPHENSON ASCOLESE, LLP
4807 SPICEWOOD SPRINGS RD.
BLDG. 4, SUITE 201
AUSTIN, TX 78759

EXAMINER	
LAFORGIA, CHRISTIAN A	
ART UNIT	**PAPER NUMBER**
2131	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/583,177	JAIN ET AL.	
	Examiner	Art Unit	
	Christian La Forgia	2131	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) *1-26,31,37,44 and 50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *27-30,32-36,38-43,45-49 and 51-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/5/04; 8/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 August 2004 has been entered.

2. Claims 1-59 have been presented for examination.

3. Claims 1-26, 31, 37, 44, and 50 have been cancelled without prejudice or disclaimer of the subject matter in the amendment filed on 18 July 2003 as indicated by the Applicant.

Response to Arguments

4. Applicant's arguments with respect to claims 27-30, 32-36, 38-43, 45-49, and 51-59 have been considered but are moot in view of the new ground(s) of rejection.

5. See further rejections below.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 27-30, 32-36, 38-43, 45-49, and 51-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,195,553 to Claffery et al., hereinafter Claffery, in view of U.S. Patent No. 5,596,719 to Ramakrishnan et al., hereinafter Ramakrishnan, and further in view of U.S. Patent No. 6,058,103 to Henderson et al., hereinafter Henderson, in view of U.S. Patent No. 6,212,171 to LaFollette et al., hereinafter LaFollette.

8. As per claims 27, 40, and 53, Claffery teaches a computer system comprising:

generating a first matrix from the first set of network element pairs (Figure 1 [block 10]; column 5, line 58 to column 6, line 15; column 8, lines 15-20), wherein

each row in the first matrix corresponds to a corresponding network element pair in the first set of network element pairs (Figure 1 [block 10]; column 5, line 58 to column 6, line 15; column 8, lines 15-20), and

form a second set of network element pairs (Figure 1 [block 16]; column 6, lines 22-54), wherein

the second set of network element pairs contains independent network element pairs in the first set of network element pairs (column 8, lines 26-33), and

each one of the independent pairs of network element corresponds to a one of the independent rows of the first matrix (column 8, lines 15-20; column 8, lines 26-33);

9. Claffery does not disclose identifying pairs of the network elements as being in a first set of network element pairs, said first matrix comprises independent rows and non-independent rows, measuring a measured network performance metric between a first network element and a second network element of each network element pair in the second set of network element pairs, and computing a computed network performance metric between a first network element and a second network element of a remaining network element pair in the first set of network element pairs using at least one of the measured network performance metrics, wherein the remaining network element pair corresponds to a non-independent row of the first matrix.

10. Ramakrishnan discloses identifying pairs of the network elements as being in a first set of network element pairs (Figure 3, column 1, lines 57-65, column 8, lines 15-43).

11. It would have been obvious to one of ordinary skill in the art at the time the invention was made to identify pairs of the network elements as being in a first set of network element pairs, since it has been held that substituting equivalents known for the same purpose requires only routine skill in the art. See MPEP § 2144.06; see also *Smith v. Hayashi*, 209 USPQ 754 (Bd. of Pat. Inter. 1980), which held that two items that are known to have the same function in the art presents strong evidence in substituting one for the other. In this case, identifying pairs of network elements and identifying links are both known and used in the art for determining the shortest path through a network.

12. Henderson teaches wherein the first matrix comprises independent rows and non-independent rows (Figures 5c and 5d; column 14, lines 9-56). Wherein the independent rows are drawn to connection numbers 511, 513, 514, 516-519, and 522 and the non-independent rows are drawn to connection numbers 512, 515, 520, and 521.

13. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have first matrix comprise of independent and non-independent rows, since it has been held in Claffery in column 18 that such a modification would aid in measuring performance metrics between adjacent nodes and computing performance metrics for nodes that have an intervening node.

14. LaFollette discloses measuring a measured network performance metric between a first network element and a second network element of each network element pair in the second set of network element pairs (Figure 4 [blocks 402, 406], column 5, lines 3-17, column 6, lines 47-67); and

computing a computed network performance metric between a first network element and a second network element of a remaining network element pair in the first set of network element pairs using at least one of the measured network performance metrics, wherein the remaining network element pair corresponds to a non-independent row of the first matrix (column 5, lines 3-17, column 6, lines 47-67, column 8, lines 7-19).

15. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the measuring and computing steps, since LaFollette states at column 6, lines 26-40 that such a modification would provide an accurate measure since the measure node is not on the path that connects the network element pairs.

16. Regarding claims 28 and 41, Claffery teaches wherein the first set of network element pairs is a requirements set (Figure 1 [block 10]; column 5, line 58 to column 6, line 16; column 8, lines 15-20).

17. With regards to claims 29 and 42, Claffery teaches wherein the second set of network element pairs is a measurements set (Figure 1 [block 16]; column 6, lines 22-29).

18. Concerning claims 30, 39, 43, and 52, Claffery teaches wherein each one of the network elements is a router (column 5, lines 40-58).

19. Regarding claims 32, 45, and 54, Claffery teaches wherein the computer code is further configured to cause the processor to compute a number, wherein the number is equal to a rank of the first matrix (column 4, lines 31-44);

determine if a first the number of rows of the first matrix are independent (Figure 1 [block 12]; column 4, lines 31-44; column 8, lines 21-25); and

if the first the number of the rows of the first matrix are not independent, re-arrange the rows of the first matrix such that the first the number of the rows of the first matrix are independent (Figure 1 [block 12]; column 4, lines 31-44; column 8, lines 21-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to compute a number that is equaled to the rank of the first matrix. One of ordinary skill in the art would be motivated to rank the matrices as it serves as a way to rank those network elements which provide a connection between the source and destination nodes while eliminating those matrices that do not provide a path between the source and destination nodes.

20. Concerning claims 33, 46, and 55, Claffery teaches wherein the computer code is further configured to cause the processor to identify a maximal set of independent rows of the first matrix based on the number (Figure 1 [block 12]; column 4, lines 31-44; column 8, lines 21-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to compute a number that is equaled to the rank of the first matrix. One of ordinary skill in the art would be motivated to rank the matrices as it serves as a way to rank those network elements which provide a connection between the source and destination nodes while eliminating those matrices that do not provide a path between the source and destination nodes.

21. With regards to claims 34, 47, and 56, Claffery teaches wherein the computer code configured to cause the processor to re-arrange the rows of the first matrix such that the first the number of the rows of the first matrix are independent, if the first the number of the rows of the first matrix are not independent, is further configured to cause the processor to re-arrange the pairs of the network elements in the first set of network element pairs such that the correspondence between each row of the first matrix and the corresponding network element pair in the first set of network element pairs is maintained (Figure 1 [block 12]; column 4, lines 31-44; column 8, lines 21-25).

22. Regarding claims 35, 48, and 57, Claffery teaches wherein the computer code configured to cause the processor to form the second set of network element pairs is configured to cause the processor to copy a first the number of pairs of the network elements in the first set of network element pairs into the second set of network element pairs (column 6, lines 22-29).

23. Regarding claims 36, 49, and 58, Claffery teaches wherein the computer code configured to cause the processor to compute the computed network performance metric between the first network element and the second network element of the remaining network element pair is configured to cause the processor to:

form a second matrix (Figure 1 [block 16]; column 6, lines 22-29; column 8, lines 26-33), wherein

each row of the second matrix corresponds to a corresponding one of the non-independent rows of the first matrix (column 8, lines 26-33), and

the each row of the second matrix is such that the corresponding one of the non-independent rows of the first matrix can be expressed in terms of the independent rows using the each row of the second matrix (column 8, lines 26-33);

organize the measured network performance metrics into a vector (Figures 1 [block 18], 2; column 8, line 43 to column 9, line 16); and

compute the computed network performance metric between the first network element and the second network element of the remaining network element pair by multiplying the vector by a row of the second matrix corresponding to the remaining network element pair (Figures 1 [block 18], 2; column 8, line 43 to column 9, line 16; column 9, lines 22-53).

24. Regarding claims 38, 51, and 59, Claffery teaches wherein the computer code configured to cause the processor to compute the computed network performance metric between the first network element and the second network element of the remaining network element pair is further configured to configured to cause the processor to create a vector equivalent to the non-independent row of the first matrix by combining a plurality of the independent rows of the first matrix (Figures 1 [block 18], 2; column 8, line 43 to column 9, line 16; column 9, lines 22-53); and

compute the computed network performance metric by combining a measured network performance metric of each network element pair of the second set of network element pairs

corresponding to one of the plurality of the independent rows of the first matrix (Figures 1 [block 18], 2; column 8, line 43 to column 9, line 16; column 9, lines 22-53).

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26. The following patents are cited to further show the state of the art with respect to determining the shortest route through a network, such as:

United States Patent No. 6,762,997 to Liu et al., which is cited to show finding shortest network routing paths subject to system constraints.

United States Patent No. 6,061,331 to Conway et al., which is cited to show computing network metrics from already measured network metrics.

United States Patent No. 6,496,941 to Segal et al., which is cited to show setting up matrices to determine paths between network element pairs.

United States Patent No. 5,142,570 to Chaudhary et al., which is cited to show routing of network traffic using discrete traffic measurement data.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian La Forgia whose telephone number is (571) 272-3792. The examiner can normally be reached on Monday thru Thursday 7-5.

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on (571) 272-3795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christian LaForgia
Patent Examiner
Art Unit 2131

EMMANUEL L. MOISE
PRIMARY EXAMINER

clf